

Docket No. 740819-466
Application No. 09/734,176
Page 7

REMARKS

The Examiner's final Office Action of March 29, 2004 has been received and its contents reviewed. By the above actions, claims 1 and 10 have been amended, claims 3-5 have previously been withdrawn, and new claims 16-24 have been added. Accordingly, claims 1, 10, and 13-24 are pending for consideration, of which claims 1, 18, 21, 23 and 24 are independent. Support for the amendments can be found at least in Figure 1A and at page 7, lines 11-13, page 12, lines 20-24, and page 13, lines 3-11, of the specification. In view of these actions and the following remarks, consideration of this application is now requested.

Referring now to the detailed Office Action, claims 1, 10, 14 and 15 stand rejected under 35 U.S.C. §102(b) as anticipated by the newly cited Takenaka (U.S. Patent No. 5,475,248 – hereafter Takenaka) reference, and claim 13 stands rejected under 35 U.S.C. §103(a) as unpatentable over Takenaka in view of Kanaya et al. (U.S. Patent No. 6,586,790 – hereafter Kanaya). These rejections are respectfully traversed for the reasons provided below.

The present invention relates to providing a contact layer 5, which is either a single-layer or multi-layer structure, on the upper electrode between the upper electrode 4 and an insulating film 6, so as to improve adhesion between the insulating film 6 covering the capacitor and the upper electrode 4. Specifically, as shown in Figure 1A and discussed in the specification, page 7, lines 11-13, the contact layer 5 is provided on the upper electrode 4 and in a region other than the region where the upper electrode 4 and metal interconnect 8B are in contact with each other and so as not to be in contact with the capacitive insulating film 3. Further, according to the claimed structure in which the upper surface of the upper electrode 4 and the insulating film 6 are not in contact with each other (see Figure 1A), the insulating film is prevented from peeling-off of the upper electrode which is caused by annealing at a high temperature. Additionally, since the contact layer 5 is either a single or multi-

NVA301550.1

Docket No. 740819-466
Application No. 09/734,176
Page 8

layer structure of metal oxide(s) or metal nitride(s), the metal atoms in the contact layer 5 are prevented from diffusing into the upper electrode 4 even if annealing is performed after forming the contact layer 5. That is, while the insulating film is prevented from peeling-off, the metal atoms can be prevented from diffusing into the capacitive insulating film through the upper electrode 4. Consequently, degradation in the polarization properties of the capacitive insulating film 3 can be prevented as discussed in the specification.

In contrast, Takenaka discloses a reaction-preventing film 61 (which corresponds to the contact layer 5) provided on a portion of the upper electrode 32 to prevent a reaction with the wiring electrode 62, and the reaction-preventing film 61 (Ta₂N₅) serves as a wiring (interconnect) for drawing out an electrode to electrically connect the upper electrode 32 and the source diffusion region 24 (see Figure 7; column 8, lines 11-32). As a result, the structure disclosed by Takenaka has the reaction-preventing film 61 provided on a surface of the upper electrode 32 in the region where the metal interconnect to the upper electrode 32 is formed, i.e., that is in direct contrast to the invention of claim 1 in which the contact layer 5 is provided on the upper electrode 4 in a region other than the region where the metal interconnect 8B is in contact with upper electrode 4, as shown in Figure 7. Clearly, the Takenaka patent desires to have the upper electrode 32 in connection with the source region 24 via the interconnect, reaction-preventing film 61; while, in the present invention of claim 1, the upper electrode 4 is connected to a metal interconnect 8B without the use of the contact layer 5 in the interconnect region.

Furthermore, Takenaka teaches that the interlayer insulation film 63 formed on the reaction-preventing film 61 is not in contact with the lower electrode 28, the ferroelectric film 29 or the upper electrode 32, but is in contact with only a portion of the upper surface of the upper electrode 32 (see Figure 7). This structure is in contrast to the features of claim 21 (wherein an insulating film is formed directly on

NVA301550.1

Docket No. 740819-466
Application No. 09/734,176
Page 9

the contact layer so as to cover the lower electrode, the capacitive insulating and the upper electrode, and the insulating film being connected to the lower electrode and/or the capacitive insulating film) and claims 16, 20, 21, 23 and 24 (wherein the entire upper surface of the upper electrode is in no contact with an insulating film). Therefore, Takenaka not only does not teach the particular structural configuration of the independent claims 1, 18, 21, 23 and 24, but the invention of Takenaka does not solve the problem of peeling-off of the edge of the interlayer insulating film 33 (see Figure 7) at an edge of the upper surface of the upper electrode 32 as presently disclosed.

Since Takenaka does not teach each and every feature of the invention as presently claimed, anticipation cannot exist. Therefore, withdrawal of the § 102(b) rejection of claims 1, 10, 14 and 15 is now respectfully requested.

With regard to the § 103(a) rejection of claim 13, a review of Kanaya et al. reference (cited to allegedly teach the obvious use of $\text{SrBi}_2\text{Ta}_2\text{O}_9$ and discussed at length in the Amendment of December 23, 2003) reveals that the patentees set forth no teaching or suggestion which would motivate one of ordinary skill in the prior art to modify the teachings of Takenaka to remedy the deficiencies noted in Takenaka above. Consequently, a *prima facie* case of obviousness does not exist with regard to the combination of Takenaka and Kanaya et al., and the rejection of claim 13, under § 103(a), must now also be withdrawn.

While the present application is now believed to be in condition for allowance, should the Examiner find some issue to remain unresolved, or should any new issues arise, which could be eliminated through discussions with Applicants' representative, then the Examiner is invited to contact the undersigned by telephone in order that the further prosecution of this application can thereby be expedited.

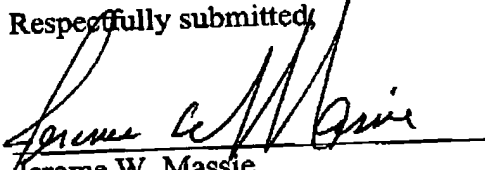
Lastly, it is noted that a separate Extension of Time Petition (one month) accompanies this response along with an authorization to charge the requisite

NVA301550.1

Docket No. 740819-466
Application No. 09/734,176
Page 10

extension of time fee to Deposit Account No. 19-2380 (740819-466). However, should that petition become separated from this Amendment, then this Amendment should be construed as containing such a petition. Likewise, any overage or shortage in the required payment should be applied to Deposit Account No. 19-2380 (740819-466).

Respectfully submitted,



Jerome W. Massie
Registration No. 48,118

NIXON PEABODY LLP
401 9th Street, N.W.
Suite 900
Washington, DC 20004-2128
(202) 585-8000
(202) 585-8080 fax

DRS/JWM

NVA301550.1